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COMPUTER SCIENCE NEWSLETTER

No. 78

Edited by Mr. C. Alan Ford

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SUGGESTIONS

The use of the suggestion boxes has slumped somewhat, to a yield of only eighteen items this month. Only four of these were novel, two concerning catalogued data sets and one each regarding punched output and the need for a double precision MINV subroutine. The balance ranged over questions of documentation, rates and limits, output handling, and physical amenities. All items have received full attention from UTCC staff and management.

The following comments may be of interest:

- rates and system limits are set after careful consideration of all factors, including suggestion box submissions. Don't be discouraged because everything you suggest doesn't happen...most suggestions seem to have matching countersuggestions;
- the rate for SETUP jobs is intended to pay for some of the disk and tape drives as well as the operator who does the set up;
- WATFIV will replace WATFOR, at a 10 second limit. See previous Newsletters. The low limits are essential to the High-Speed in High Speed Job Stream;
- elastics around decks at EUT and ASUT will be the general rule, pressure of traffic permitting. Alternative safeguards are being considered;
- "pseudo-technical IBM jargon" is hard to avoid and hard to live with. But we haven't ABENDed out attempts to survive with you (ABnormally END?)
- how do you like the new waste baskets?
- a special thanks to John Metzger (DCS) for an eight page proposal on how to improve the symmetry between S/360 Nos. 1 and 2 through improved management of users catalogued data sets. We are working with John along lines he suggested.

IBM MANUALS

An order for over five copies of any one IBM manual takes four weeks for IBM to fill after the order. Rush orders with a ten day turnaround are possible, at an additional charge for the service. Teaching professors planning on using an IBM manual as a text for a course should submit orders to the textbook store as soon as possible to ensure availability of the manuals when required. To place orders for manuals, contact Ron Billings, Engineering Unit, Textbook Store, phone 928-7080.

USERS' SERVICES GROUP STAFF CHANGES

Carol Davidson and Herb Kugel are now located in Room 130 of the Sandford Fleming Building, phone 928-7180. Carol is now working on setting up some additional courses for users of the Computer Centre. The first of these courses are expected to be held before this Newsletter is issued.

Mr. Stan Yagi has also joined USG and will be working as a Program Advisor in Sandford Fleming Room 130.

ASIS - 1972 ANNUAL MEETING TO BE HELD IN WASHINGTON, D. C.

The 35th Annual Meeting of the American Society for Information Science (ASIS) will be held October 23-26, 1972, at the Shoreham Hotel, Washington, D. C.

John Sherrod, ASIS-72 Conference Chairman and Director, National Agricultural Library, has announced that the theme of the conference will be "A World of Information". Emphasis will be focused on international cooperation in the information field. Information scientists, librarians, and computer specialists in foreign countries and the United States will be invited to present papers.

For further information on the ASIS-72 Conference, contact Robert McAffee, Jr., ASIS Headquarters, 1140 Connecticut Avenue, N.W., Suite 804, Washington, D.C. 20036. Telephone: 202/659-3644.

BOOK REVIEW: I/O CONCEPTS AND JCL

The book "Introduction to I/O Concepts and Job Control Language for the IBM Operating System 360", by Gordon Ashby and Robert Hertman (Dickson Publushing Co., Encino, Calif.), has been received and studied by several UTCC staff members. As a first impression, one wondered why IBM publications on JCL could not have been user-oriented enough to make this book unnecessary. A second impression was that this is not the best amongst the crop of books on JCL (see the review in our NL No. 71, Dec. 1970 of a preferred example). On further thought, the authors of this volume did do justice to a principle factor in using OS/360 JCL, the effect of local standards in matters such as block sizing, default options, and tape labelling standards. Exercises given with each chapter are being circulated to UTCC staff with this question: "How easily can you find or verify answers to the installation-dependent questions by reference to the UTCC Users Reference Manual?".

SYSTEM STATUS BULLETINS ISSUED

32:71:1 New Hours for Engineering Undergraduate Terminal
:2 7094 Fortran Bug

33:71 Changes in Advising Facilities

34:71 User's Telephone Service

35:71 Extended Program Advising Hours for EUT

36:71 PL/C Now Available Under HASP.

37:71 Lock Character for Authorization Codes

37:71 Two Computer Centre Courses

38:71 WATFIV Problem with NAMELIST and DUMPLIST

39:71:1 High Speed Job Stream Service Changes

:2 WATFIV User Guide for General Purpose Job Stream

40:71 PL/C, ASMG, WATFIV User's Guides

SHARE XXXVII, NEW YORK, AUGUST 9 to 13

The Agenda is now available. It may be inspected in Room 105 Sandford Fleming.

PART-TIME PROGRAMMER AVAILABLE

Call Jarnail Singh:

- 365-5461
or - 491-9300 (after 5:00 p.m.)

(70 Cairnside Cres., Willowdale)

NEW ACQUISITIONS IN THE DEPARTMENT OF COMPUTER SCIENCE LIBRARY

Advances in computers. v.11, 1971.

American Society for Information Science. Proceedings. 1970.
Annual meeting no. 7: the information conscious society.

Barbour, E. H.
PL/1: a self-instructional manual. 1970

Benice, D. D.
Introduction to computers and data processing. 1970.

Botvinnik, M. M.
Computers, chess and long-range planning. 1970.

Brandt, S.
Statistical and computational methods in data analysis. 1970

Conference on Applications of Simulation, 2d, New York, 1968.
Second Conference on Applications of Simulation.
SHARE/ACM/IEEE/SCI.

Cuttle, G., ed.
Executive programs and operating systems. 1970.

Eilenberg, S., and Elgot, C. C.
Recursiveness, 1970.

Fletcher, R., ed.
Optimization. 1969.

Foster, J. M.
Automatic syntactic analysis. 1970.

Fung, K. S.
Interactive software for experimental purposes. (M.Sc. thesis) 1970.

Favrilov, M. A., and Zakrevskii, eds.
LYaPAS: a programming language for logic and coding algorithms. 1969.

Greenspan, D.
Introduction to numerical analysis and applications. 1971.

Greville, T. N. E., ed.
Theory and applications of spline functions. 1969.

Griswold, R. E., Poage, J. F., and Polonsky, I. R.
The SNOBOL4 programming language. 2d ed. 1971.

Hellwig, J.
Introduction to computers and programming. 1969

Henley, J. P.
Computer-based library and information systems. 1970

International Conference on Methodologies of Pattern Recognition, Honolulu, 1968
Methodologies of pattern recognition, ed., by S. Watanabe. 1969.

Jackson, L. W.
Automatic error analysis for the solution of ordinary differential equations. (Ph. D. thesis) 1971

Joint Computer Conference.
Proceedings of the 1971 SJCC (V.38)

Kanter, J.
Management guide to computer system selection and use. 1970

Katzan, J., Jr.
Advanced programming: programming and operating systems. 1970

Klir, George J.
An approach to general systems theory. 1969.

Lattes, R. and Lions, J. L.
The method of quasi-reversibility: applications to partial differential equations. 1969.

Lebow, Kenneth S.
Approximation of functions by splines. (M.Sc. thesis) 1971.

Levin, H.
Introduction to computer analysis: ECAP (Electronic Circuit Analysis Program) for electronics technicians and engineers. 1970.

Maley, G. A.
Manual of logic circuits. 1970

MacKay, D. M.
Information, mechanism, and meaning. 1969.

McKay, H. R.
The graphic display of computing concepts. (M.Sc. thesis) 1971.

Norman, D. A., ed.
Models of human memory. 1970

Scott, R. C. and Sondak, N. E.
Pl/1 for programmers, 1970

Sherman, P. M.
Techniques in computer programming. 1970

Sparkes, J. J.
Transistor switching and sequential circuits. 1969

Symposia in Numerical Solution of Nonlinear Problems, Philadelphia, 1968. Numerical solutions of nonlinear problems. Ed. by J. M. Ortega and W. C. Rheinboldt. 1970.

Tutunjian, J. P.
Many Computer Abbreviations for Defining Your Terms Easily. 2d ed. 1971

United Nations. Dept. of Economic and Social Affairs.
The application of computer technology for development. 1971.

Waterloo Conference on Combinatorics, 3d, Waterloo, Ontario. May 1968. Recent progress in combinatorics. Ed. by W. T. Tutte. 1969.

NEW HIGH-SPEED JOB STREAM FEATURES - COMING SOON

At this time work progresses on the following High-Speed Job Stream Service improvements, all of which are scheduled for implementation before the school year starts in September:

1. Removal of all batch and processor separators. This will reduce the amount of printing at the terminals, improving convenience for the user. All statistics are now gathered by the system itself;

2. Individual, preprinted, pre-punched colour coded HSJS control cards will be made available at the terminals;

3. EUT WATFIV OMR (optical mark recognition) support will be implemented. OMR should absorb part of the load on the keypunches;

4. User guides to all existing HSJS Processors (except WATFOR) will be made available together with a guide to the HSJS Terminals;

5. Two new processors will be added to the service, PLUTO - a PL/I compiler developed by the Computer Systems Research Group of the University of Toronto and PL/C - a PL/I compiler developed at Cornell University.

SERVICE SCHEDULES REVISED

Commencing Tuesday August 3rd, 1971, the hours for System Test Time will be changed for System #1, thus opening the hours for processing user jobs as follows:

	Monday to Friday	Saturday and Sunday
CPJS	midnight - 7 a.m.* 9 a.m. - 10 p.m.	9 a.m. - 5 p.m.
CPS/ATS/APL	midnight - 7 a.m.* 9 a.m. - 10 p.m.	9 a.m. - 5 p.m.
EUT	9 a.m. - 10 p.m.	Not Scheduled for August
ASUT	Not Scheduled For August	Not Scheduled For August

* System tests after 5:00 a.m. may restrict use on occasion. Check in the Input/Output Room or by the Codaphone (928-6234).

CHANGE IN HANDLING CLASS D, E AND M JOBS

Effective August 3, 1971 users running class "D", "E" or "M" jobs must include a "Special Job Request Form" when submitting a job. The "Special Job Request Form" should specify all the user disk packs and/or tapes required for the job, the amount of core required, and the estimated execution time (ERT). Remote terminal users should have the "Special Job Request Form" phoned into the Computer Centre by the terminal operator.

These jobs will be placed automatically into "HOLD STATUS" for subsequent release by the computer operator. This procedure should result in better scheduling of this class of job, thus better turnaround and throughput for the users. Service levels will continue to be adhered to as closely as possible. Jobs in excess of 30 minutes estimated time or 60,000 lines still require approval of the (Chief Operator) Processing Supervisor in Room SF 112; phone 928-5058.

PRODUCTION STATISTICS: YEAR-END REPORT

The academic year 1970/71 is over. For UTCC and our users it was a year of many new things. A comprehensive price list and real dollar charges were noteworthy features. The addition of more core memory onto one S/360-65 improved turnaround and throughput substantially, allowing users to obtain better value per job through the use of the cheaper service levels.

The pattern of use during the final quarter of 1970/71, illustrated by Table I, was quite similar to the pattern of 1969/70, with the main change in volume occurring at the high speed job stream terminals.

As shown in a June 70/June 71 comparison, Table II, the use of S/360 has continued upward at a rate which more than balances the reduction in jobs on the 7094. The same held true through both the years 1969/70 and 1970/71, Table III.

The overall 15% growth from the 1969/70 volume to the 1970/71 volume is reasonably close to the historical trend, despite the dampening effect of the real dollar charges for research jobs.

SYSTEM	APRIL	MAY	JUNE	JUNE/MAY CHANGE
S/360	19,598	17,631	18,431	+ 5%
7094	1,293	1,077	1,032	- 4%
HSJS	48,756	20,870	24,595	+18%
TOTAL	69,647	39,578	44,058	+11%

TABLE I: NUMBER OF JOBS PROCESSED APRIL 1971 THROUGH JUNE 71

SYSTEM	JUN 70	JUN 71	CHANGE
S/360	13,828	18,431	+33%
7094	2,921	1,032	-65%
HSJS	28,718	24,595	-14%
TOTAL	45,467	44,058	- 3%

TABLE II: COMPARISON: JUNE 1970 AND JUNE 1971

SYSTEM	1969/70	1970/71	CHANGE
S/360	118,937	198,628	+67%
7094	45,290	18,506	-59%
HSJS	464,359	508,523	+10%
TOTAL	628,586	725,657	+15%

TABLE III: COMPARISON: 1969/70 AND 1970/71

CREDIT REQUEST SUMMARY FOR JUNE 1971

	THIS MONTH			LAST MONTH
	S/360	7094	TOTAL	TOTAL
HUMAN	13	4	17	23
SOFTWARE	5	0	5	7
HARDWARE	11	0	11	9
TOTAL	29	4	33	39
PERCENT OF JOBS RUN			.20%	.16%

The credit requests for June were reduced in number compared to previous months. The causes were widely distributed throughout the processing systems, with no particular source to be cited. The dollars credited in June amounted to 0.66% of dollars billed.

UPDATE TO ASSEMBLER G IN THE S/360 GENERAL PURPOSE JOB STREAM

As announced in SSB 38:71 the version of ASMG, accessed via the ASMGC, ASMGCL, ASMGCLG procedures, has been replaced by a revised version - ASMG2.4. This version is fully compatible with Release 19 of Assembler F. Its major changes deal mostly with operational improvements in the Batch, Execute options as well as the correction of most bugs. A more detailed description of the changes may be found at the beginning of the new Assembler G Users Guide.

To obtain the guide you need only run the following job through the general purpose stream:

```
// JOB etc. with time estimate of 1 minute and line
                              estimate of 5000 lines
// EXEC PGM=IEBPTPCH
//SYSPRINT DD SYSOUT=A
//SYSUT1 DD DSN=IC.ASMGUIDE,DISP=SHR
//SYSUT2 DD SYSOUT=A,DCB=(RECFM=FM,LRECL=133,BLKSIZE=133)
//SYSIN DD *
   PRINT PREFORM=M
/*
//
```

Anyone having any problems with ASMG2.4 should contact the program advisor in Sandford Fleming, Room 103.

PL/C NOW AVAILABLE IN THE S/360 GENERAL PURPOSE JOB STREAM

As announced in SSB 36:71, the PL/C V5.4 compiler developed by the Department of Computer Science at Cornell University is now available on both systems in the general purpose S/360 job stream. The following job could be submitted to access this compiler:

```
//  JOB etc.
//  EXEC PLC
//SYSIN DD *

PL/C job or batch of PL/C jobs.

/*
//
```

PL/C is a compiler for a large subset of the PL/I language offering high compilation speed, efficient batch processing, and extraordinary diagnostic assistance. PL/C was designed primarily for educational use and for program checkout, but it is generally useful for any jobs where compilation time is large relative to execution time. The object code produced by PL/C is not optimized, and it includes some diagnostic monitoring instructions, so that program execution under PL/C is not as fast as it would be under an optimizing compiler. However, PL/C is a compiler rather than an interpreter and it does not suffer the significant performance degradation of interpretation.

The PL/C RELEASE 5 User's Guide may be obtained by running the following HASP job:-

```
// JØB etc. with time estimate of 1 minute and line
                                         estimate of 5000 lines
// EXEC PGM=IEBPTPCH
//SYSPRINT DD SYSOUT=A
//SYSUT1   DD DSN=IC.PLCGUIDE,DISP=SHR
//SYSUT2   DD SYSOUT=A,DCB=BLKSIZE=133
//SYSIN    DD *
  PRINT PREFORM=A
/*
//
```

Anyone having any problems in accessing PL/C or in using the Compiler should contact the program advisor in Sandford Fleming, Room 103.

COMPUTER OUTPUT MICROFILMING

A user has drawn our attention to the possibilities of supplying computer output microfilming service. An investigation of the idea has begun. The COM technique provides simply a compact archiving process or possibly a rapid visual retrieval method as well. Costs and practicalities will be considered for several alternative approaches. Expressions of user interest in this service will be welcomed. Address them to C. A. Ford, Assistant Director, Room 105, Sandford Fleming.

IC.STATLIB - Statistical Programs

The University of Toronto Computer Centre is implementing a library of Statistical Programs called IC.STATLIB. Initially the library will consist of the Biomedical Computer programs distributed by the University of California. However, in future, other statistical programs of use to the user community will be included. This library differs from other libraries at UTCC in that the programs in it are complete, i.e. not subroutines, hence no mainline program need be written to call the library members.

The BMD programs currently in the library were designed for use by the non-programming research worker. Although little knowledge of computers or programming is required, knowledge of the subject matter is necessary, particularly for the more complicated statistical analyses. Due to the nature of this package, it should be understood that some problems will require the use of several programs in succession. A brief description of these programs is available in room 103, Sandford Fleming Building.

PUBLICATIONS

(1) Biomedical Computer Programs
W. J. Dixon, editor
University of California Press.

(2) Biomedical Computer Programs
X-series Supplement
W. J. Dixon, editor
University of California Press.

Both of these publications may be purchased from:

BMD Programs Coordinator,
Health Sciences Computing Facility,
AV-111 Health Services Building,
University of California,
Los Angeles, California 90024.

OPERATIONAL DETAILS

There are two procedures for accessing programs in IC.STATLIB depending on the type of program.

Type I

All programs not listed under Type II should use this procedure.

```
//    360 JOB card
//name EXEC STAT,PROG=program
//STAT.SYSIN  DD  *
      Control cards and data go here
/*
//
```

where "name" is any name and "program" is the name of the program you wish to have executed.

Type II

Four of the BMD programs BMDX77, BMDX84, BMDX85 and BMDX94 are "open-ended" and can be used in a way that allows the user to write his own subroutine to modify data or to supply a function and its derivatives. These programs should be accessed by the following procedure. It should be pointed out that the method described in the BMDX manual is not available at this installation and that the complete subroutine must be supplied. The following is a list of the mandatory statements required by each of these subroutines.

BMDX77:

```
SUBROUTINE TRANS(X,U,S,C,NC,NDR,NV,SELECT)
DIMENSION X(NV),U(NV),S(NV),C(NV)

      User supplied FORTRAN statements
RETURN
END
```

BMDX84:

```
SUBROUTINE TRANS (X,NV,NC,NPR,SELECT)
DIMENSION X(NV)
      User supplied FORTRAN statements
RETURN
END
```

BMDX85:

```
SUBROUTINE FUN(F,FP,P,X)
DIMENSION FP(---),P(---),X(---)
      User supplied FORTRAN statements.  The quantities (---)
      must be defined by the user.
RETURN
END
```

BMDX94:

```
SUBROUTINE TRANS(X,U,S,C,GMN,HMN,GMC,NC,NVR,NPR,NPS,SELECT)
DIMENSION X(NVR),U(NVR),S(NVR),GMN(NVR),HMN(NVR),GMC(NVR),C(NVR)
      User supplied FORTRAN statements
RETURN
END
```

The following is the Type II procedure,

```
//    360 JOB Card
//name EXEC STATOPEN,PROG=program
//FORT.SYSIN  DD  *
      User Supplied FORTRAN subroutine
/*
//STAT.SYSIN  DD  *
      Control cards and data go here
/*
//
```

Please direct any questions concerning the above to Andy Kowaliw, Room 130, Sandford Fleming Bldg. Telephone; 928-8701.

PROCEDURE FOR USING THE SPECIAL TN PRINT TRAIN

The Computer Centre has a modified "TN" Print Train for printing with upper and lower case characters, some accents, and special symbols. To use this feature please submit the jobs to the processing supervisor (Chief Operator) in Room SF 112. The forms parameter in the user Job Card must specify "19" (forms type) and a special Job Request Form is required, indicating the type of print train. For further details on special characters available, etc., contact D. Tough, Processing Supervisor, Sandford Fleming, Room 112 or phone 928-5058.

SYSTEMS RELIABILITY

We comment only that the very good reliability shown in the table below isn't good enough yet.

SYSTEM	MONTH	UPTIME	MTBF
S/360 #1 Local & Remote GPJS and Interactive Systems.	May June	98.3 % 97.32%	23.4 hrs. 20.5 hrs.
S/360 #2 Local GPJS and HSJS	May June	93.3 % 97.66%	10.6 hrs. 17.2 hrs.

I. To Override Punched Output

The following should be used to override punched output in Fortran GO steps.

```
//FT07001 DD DUMMY,SYSOUT=
```

II. Overriding DD Statements in a Catalog Procedure

The users JCL cards overriding the statements in a procedure must be in the same order as those in the procedure itself. Also, all DD cards for overrides must precede those for new DD statements or the override will not be effective. For example to override the FT02F001 and FT03F001 DD statements, the users' deck must be of the form:

```
//    EXEC FORTGCLG
//FORT.SYSIN  DD *

/*

//GO.FT02F001  DD
//GO.FT03F001  DD
//GO.SYSIN     DD *


/*
```

III. Control of Line Count

Users should be aware of the facility to control the number of lines printed on a page, using the ninth accounting subparameter. This subparameter allows a user to specify directly the number of lines to be printed in the GO step of his program. The number specified will determine the maximum number of lines printed per page. A lesser number can be obtained where required in a program, by use of the carriage control characters in the program itself. Sixty lines can be contained within the lined portion of our present printer forms, so a line count of sixty or less will prevent printing of output on "UNIVERSITY OF TORONTO" at the bottom of a page.

Omission of the line count subparameter results in printing which does not skip over the bottom of the page. This may be desirable in instances such as outputting plots on the line printer.

Users should consult pages 4-12 and 4-13 of the Users' Reference Manual for full details of all the subparameters in the accounting field of the JOB card.

COMPUTER RESEARCH FACILITY

(i) Schedule of Charges for 1971/72
(iii) CRF Staff Directory

SCHEDULE OF CHARGES FOR 1971/72

The following rates are effective as of July 1st., 1971. The cost of a research unit is 25 cents and this purchases one dollar's worth of C.R.F. services.

SERVICE	COST IN RESEARCH UNITS	COST IN DOLLARS
IBM System 360, Model 44		
MFT Service		
- CPU Time (per Hour)	300	($75.00)
- Elapsed Time Surcharge (per hour)		
- Graphics Jobs	100	($25.00)
- RADDT Jobs (includes RADDT Charge)	200	($50.00)
- Class L Jobs	180	($45.00)
- Input/Output (per call) (For full details see the CRF MFT Accounting Algorithm --IB12:71)	Nil	Nil
PCP Service		
- Elapsed Time (per hour)	200	($50.00)
- 1403-2 line printer (per line)	0.0005	(0.0125¢)
- 1403-N1 line printer (per line)	0.0010	(0.0250¢)
- 2501-B1 card reader (per card)	0.0005	(0.0125¢)
- 2501-B2 card reader (per card)	0.0010	(0.0250¢)
- 2311 Disk (per access)	0.0010	(0.0250¢)
- 2314 Disk (per access)	0.0010	(0.0250¢)
- 2401 Tape (per access)	0.0010	(0.0250¢)
- 2250 Graphical Display (per hour)	36	($9.00)
- RADDT	60	($15.00)
Analog Computer - AD/4		
Normal Rates		
Users are billed for *both* the elapsed time and the meter time used.		
- Elapsed Rate (per hour)	40	($10.00)
- Meter Rate (per minute)	1.6	(40¢)

Teaching Rates

Teaching rates are restricted to a maximum of five hours per student per course and include a free CRF training course. Charges are for elapsed time only i.e. there is no charge for meter time.

-Elapsed Rate (per hour)	40	($10.00)

Microfilm Plotter

- Set-up Charge (per job)	30	($7.50)
- Film &Chemicals (per frame)	0.02	(0.5¢)
- Prints (per print)	0.5	(12.5¢)
- Minimum Print Charge (per job)	5.00	($1.25)

N.B. The computer time to drive the plotter is charged separately.

PDP-8/I Computer

Normal Rates (per elapsed hour)	40	($10.00)

Teaching Rates

Teaching rates are restricted to a maximum of two hours per student per course and include a free CRF training course.

- Elapsed Rate (per hour)	20	($5.00)

RADDTS

RADDT charges are calculated in addition to the System 360/44 time used.

- RADDT SURCHARGE (per hour) (See System 360/44 rates on page 1)	60	($15.00)

Miscellaneous Charges

- Analog Recorder	60	($15.00)
- per day	60	($15.00)
- per 7 day week	300	($75.00)
- Address Labels (per 100)	4	($1.00)

Rates for other services are available on request.

CRF Staff Directory

The following are the new telephone and room numbers for CRF staff:

COMPUTER RESEARCH FACILITY

		Room No.	Telephone Number
ENQUIRY		SF2740	8946
MANAGER	J.R. McBride	SF2740	4086
SECRETARY	T.A. Holland	SF2740	4086
ACCOUNT SERVICES	J. King	SF2740	6326
OPERATIONS			
IBM 360/44	K.C. Patnaik	SF2770	8853
(ANALOG/HYBRID) (MICROFILM)	T.C. Stevens	SF2770	8853
(DATA ACQUISITION)			
SOFTWARE SUPPORT			
PLANNING	D.R. Smith	SF2699	7133
MAINTENANCE	L.A. Milland	SF2750	5271
PROGRAMMING ASSISTANCE	K.D. Weir	SF2750	5271